AT THE ENTERPRISES AND INSTITUTES

UDC 666.29:691.32

NEW LOW-MELTING GLAZES FOR CONCRETE

M. V. Akulova[1] and Yu. A. Shchepochkina[1]

Translated from Steklo i Keramika, No. 4, p. 33, April, 1999.

Compositions of new glazes suitable for decoration of concrete are given. The glazes can be used to finish small-scale architectural structures and park sculptures.

Decoration of concrete by glazing (USSR Inventor's Certificate 627107) [1 – 3] is a relatively new field that has been evolving over recent decades. This type of finish has not yet gained wide acceptance. One of the main reasons for this is the lack of low-melting glaze compositions suitable for concrete glazing. Most glazes for ceramics do not adhere to a concrete surface.

The purpose of the present work is selection of compositions and synthesis of glazes suitable for heavy-concrete decoration.

In developing glaze compositions the authors proceeded from the condition of commonly available and environmentally safe material components being prevalent in the glaze compositions. Tables 1 and 2 give the chemical and batch compositions for the glazes.

The glaze production technology is the standard one, similar to glazes for ceramics. Except for cleaning the concrete-article surface of impurities, no additional mechanical or chemical treatment of the surface was required.

The glaze suspensions (moisture 45 – 50%) were applied to the surface of concrete articles, dried in air, and fused according to a specially chosen procedure by a gas (a mixture of propane and oxygen) flame burner of standard design. The resultant coatings adhere well to the concrete. The TCLE of glaze composition 1 is $87.76 \times 10^{-7}\,°C^{-1}$, and that of composition 2 is $53.61 \times 10^{-7}\,°C^{-1}$.

[1] Ivanovo State Architectural and Construction Academy, Ivanovo, Russia.

TABLE 1

Composition	Mass content, %													
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	ZnO	Na_2O	K_2O	BaO	B_2O_3	NaCl	Na_2AlF_6	TiO_2*	SO_3*
1	66.30	3.67	0.17	14.57	3.04	–	11.67	0.16	–	–	–	–	0.08	0.34
2	49.98	6.50	0.23	7.58	0.21	7.50	0.13	0.46	1.00	19.50	0.69	6.00	0.22	–

* Impurities.

TABLE 2

Composition	Content, g								
	glass cullet	chalk	Veselovskoe clay	quartz sand	boric acid	zinc oxide	barium chloride	cryolite	sodium chloride
1	85.00	11.36	7.56	–	–	–	–	–	–
2	–	13.52	20.00	39.10	47.33	7.62	1.36	6.85	0.69

The glazes obtained expand the range of finishing vitreous coatings for concrete and can be used to decorate small-scale architectural structures and park sculptures.

The development is protected by a patent of the Russian Federation.

REFERENCES

1. V. F. Chernykh, *Wall and Finishing Materials* [in Russian], Rosagropromizdat, Moscow (1991).
2. M. V. Akulova and Yu. A. Shchepochkina, "Selection of glaze compositions for decoration of concrete," in: *Proc. All-Russia Sci. Conf. Topical Problems of Structural Material Science* [in Russian], Tomsk (1998), p. 61.
3. L. Yu. Radyukhina and B. I. Salynskii, "Technology of coatings of colored ceramic glazes for concrete articles," in: *Proc. Seminar New Technologies and Equipment in Ceramic Production* [in Russian], Moscow (1992), pp. 15 – 16.